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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,764	02/06/2002	Sang Shin Lee	K-0392	5817

34610 7590 10/17/2003

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EXAMINER

WANG, GEORGE Y

ART UNIT PAPER NUMBER

2871

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/066,764

Applicant(s)

LEE ET AL.

Examiner

George Y. Wang

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \*   c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The newly amended Title was received on July 31, 2003. It has been approved and accepted by Examiner.
2. The newly amended Abstract was received on July 31, 2003. It has also been approved and accepted by Examiner.

### ***Claim Objections***

3. Claim 8 objected to because of the following informalities: the recitation "and/or" is improper for failing to distinguish precisely the elements of the claim. Appropriate correction is required.

### ***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first and second mirror support substrates, the first and second fiber support substrates, and the common substrate must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daneman et al. (U.S. Patent No. 6,330,102, from hereinafter "Daneman") in view of Gloeckner et al. (U.S. Patent No. 6,445,841, from hereinafter "Gloeckner"), in further view of Magel et al. (U.S. Patent No. 5,155,778, from hereinafter "Magel").

7. As to claim 1, Daneman discloses an optical switch (fig. 2) having an optical fiber input part in a predetermined region, an optical fiber output part in a predetermined region at a distance from the optical fiber input part to face each other, a first micro-mirror part between the input and output parts for reflection a light from the optical fiber input part, and a second micro-mirror part between the input and output parts, at a distance from the first micro-mirror part to have each other for reflection the light from the first micro-mirror part to the optical fiber output part. However, the reference fails to specifically disclose a substrate for the mechanical coupling of fibers and mirrors to the alignment grooves of the substrate.

Gloeckner discloses an optical switch with optical elements, such as fibers, mirrors, and lenses, situated and fixed on a substrate (fig. 10b, ref. 1090).

Magel discloses an optical switch with optical elements, such as fibers, mirrors, and lenses, situated and fixed on a substrate (fig. 1, ref. 10) and fit within grooves (fig. 1, ref. 12, 15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have fixed the elements discloses by Daneman on a substrate as in Gloeckner since one would be motivated to provide a structure that offers advantages from the architecture and packaging point of view (col. 2, lines 35-44). Although there are many possible configurations for the micromirrors, a vertical orientation forms a simple matrix switch arrangement where input and output fibers can be arranged on the same plane as the substrate, which is ideal for optical

interconnections (col. 2, lines 35-44). Furthermore, having grooves as in Magel makes suitable alignment (col. 1, lines 39-64) so that such a packaging is greatly simplified since it minimizes wasted space (Gloeckner, col. 2, lines 43-44), which ultimately is useful in reducing cost and facilitating manufacture (Magel, col. 1, lines 39-64).

8. Regarding claims 2-4, Daneman and Gloeckner disclose the optical switch as recited above. However, the reference fails to specifically disclose a substrate with grooves for fixing the input, output, and mirror parts with epoxy. Furthermore, the reference fails to disclose grooves with upper sloped sides and lower vertical sides to form a "Y" groove.

Magel discloses an optical switch with optical elements, such as fibers, mirrors, and lenses, situated and fixed on a substrate (fig. 1, ref. 10) and affixed by epoxy (col. 6, lines 50-51) within grooves (fig. 1, ref. 12, 15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have fixed the input, output, and mirror parts with epoxy within grooves of a substrate since one would be motivated ultimately to provide a structure for optical interconnections (col. 2, lines 1-2). This type of integration forms precise interconnections as well as minimizes wasted space, which ultimately is useful in reducing cost and facilitating manufacture (col. 1, lines 39-64). In addition, using epoxy, which is well-known in the art, within Y-shaped grooves, which Magel describes as "properly dimensioned grooves" (col. 2, lines 60-62) would be recognized by one of

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ordinary skill in the art to provide enhanced security and positioning of the fibers and mirrors.

9. Claims 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daneman and Magel in view of Peale et al. (U.S. Patent No. 6,480,645, from hereinafter "Peale").

Daneman et al. discloses an optical switch as recited above with the input and output parts parallel to each other and facing the mirrors at 45 degrees (Gloeckner, fig. 10b). However, the reference fails to disclose a second substrate at the face of the plurality of input and output fiber parts.

Peale discloses an optical switch with a substrate at the face of the plurality of input and output fiber parts (fig. 2, ref. 30, 35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a second substrate since one would be motivated to include other optical elements (fig. 2, ref. 32) for enhancing beam steering and control, focusing, and alignment (abstract; col. 2, lines 1-29). Such elements include collimators and lens arrays, which are all well-known in the art.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 703-305-7242. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
TOANTON  
PRIMARY EXAMINER

gw  
October 2, 2003